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No. II.

CONCENTRIC CHUCKS FOR TURNERS.

The LARGE SILVER MEDAL was this session presented to EDWARD SPEER, Esq. of New Inn, for his CONCENTRIC CHUCKS FOR TURNERS. The following communication has been received from the candidate on the subject, and a model of his invention has been placed in the Society's repository.

SIR,

7, New Inn, February 4, 1824.

I WISH to lay before the Society for the encouragement of Arts a chuck which I have invented, possessing, as I conceive, peculiar advantages. I shall be happy to attend and exhibit the same whenever the subject may come before a committee.

I am, Sir,

&c. &c. &c.

A. Aikin, Esq.

Secretary, &c. &c.

E. SPEER.

THIS chuck consists of a succession of hollow truncated cones, fitting with tolerable accuracy into each other, the outer one screwing on to the mandril, and turned like a common chuck: at the bottom is a detached circular plate of brass to force the cones out in case of any adhesion, but I have never found this necessary. It is calculated to obviate a necessity for numerous chucks which are applicable to different kinds of work, and to save a great deal of time which is lost in preparing materials, when in the

rough, for turning: in fact it may be called an universal chuck whenever the back puppet is in use.

Every one acquainted with turning is aware of the trouble attending the first fitting a piece of wood to the lathe, which seems by this contrivance, simple as it is, to be entirely obviated. Nothing more is necessary than to remove one or more of the internal cones till there is sufficient room for the admission of the substance to be operated upon; and it affords particular facility for removing any work from the lathe (a screw, for instance,) which may require to be accurately fitted before it is finished.

The chuck at present before the committee is adapted to receive any work between $3\frac{1}{4}$ and one-eighth of an inch in diameter; but there can be no objection to its being carried to any extent in point of size that may be required. It appears equally well calculated for turning brass, iron, or steel, the chucking of which is, in general, rather a troublesome operation: and it possesses one advantage which is, I believe, peculiar to itself, namely, that it is nearly impossible to injure the tool employed; for, as the work is carried round merely by the friction on the inside of the cone, which may be increased or diminished at pleasure by moving the screw in the back puppet, in the event of the tool encountering a knot, or any other impediment, this friction is invariably overcome with less violence than would be requisite to break the point of the tool, and the work remains stationary.

The cones of this chuck are turned at an angle of about twelve degrees; but whether this may be the best proportion I am not prepared to say: probably, if it should come into general use, the angle might be determined by the kind of work to be performed.

These cones are split in a spiral direction from an idea that their general expansion would create a solidity of the whole, which is certainly effected; and the spiral cut was adopted lest the coincidence of two or more might throw the work out of truth. But I apprehend that if care were taken in turning the cones that none of them touched the bottom of the chuck, they would be perfectly firm without any cut.

I have had a chuck of this kind made in brass with the cones of iron, but it is cumbrous and expensive, and does not answer so well, owing to the surface of the iron offering less resistance to the work turning within it. This, perhaps, might be remedied by roughing; but I think the chuck is much better in wood, as it can be made by any common turner at a trifling expense, and possesses more strength than can possibly be required.

SIR,

7, New Inn, May 4, 1824.

I BEG to transmit the chuck for which the Society of Arts have honoured me with their silver medal. The only difference between it and the one which I have already furnished a description of, is that the cones are turned to an angle of ten degrees, and the spiral cut in them is omitted, as I find it is perfectly unnecessary, and considerably weakens the cones.

I am, Sir,

&c. &c. &c.

E. SPEER.

A. Aikin, Esq.

Secretary, &c. &c.

Reference to the engraving of Mr. E. Speer's Concentric Chucks for Turners.—Plate III.

FIG. 1 is a section, and fig. 2 a front view of a chuck which consists of seven hollow cones placed one within another; the whole of them may be removed by pushing a pin through the screwed hole in the back of the chuck against the plate *a a*; the plate *a a* must then be replaced. The hollow cones, or chucks, may then be easily pushed out from within one another till one is found that will receive the end of a piece of wood, &c. that is intended to be chucked: they must then be replaced in their respective situations in the largest chuck, and screwed on the end of the mandril *b* of the lathe, as represented in fig. 3. The piece of wood *c*, intended to be chucked, must then be pushed into the hollow cone, and the conical centre *d* (of the puppet) must be screwed against the end of the wood, which will cause sufficient friction within the chucks, so that the mandril will turn round the chucks and the wood all together. These chucks will be found convenient for chucking the end of any irregular piece of wood when the centre *d* can be applied to the opposite end of it; and also for chucking a piece of wood, that has been turned, when the centre has been cut off one of its ends. The chucks may be made of box, or any other hard wood that is not easily split.